DOCUMENT RESUME

ED 078 461 CS 500 303

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TITLE	Recent Developments in Psycholinguistics: The Study of Language and Its Impact on Speech Pathology and Speech Education.
PUB DATE	Mar 73
NOTE	10p.; Paper presented at the Annual Meeting of the Eastern Communication Assn. (New York, March, 1973)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Behavioral Science Research; *Linguistics; *Psycholinguistics; Psychology; *Speech Education; Speech Handicapped; *Speech Pathology; Speech Tests; Speech Therapy

ABSTRACT

The study of language has had a greater impact on speech pathology and speech education than any other scholarly discipline in recent years. Researchers in the field of speech pathology must now give attention--especially in caring for the growing numbers of children found to have language difficulties--to the study of psycholinguistics. Work in these areas of speech and speech education must involve knowledge of the test instruments (for example, the Illinois Test of Psycholinguistic Abilities) and the detailed research from which they spring Developments in linguistics, psychology, and, to some extent, behaviorism require careful awareness of these fields for any worker in speech pathology and speech therapy, especially in regard to children. (CH)

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Norma S. Rees
SAES, March 8, 1973

RECENT DEVELOPMENTS IN PSYCHOLINGUISTICS: THE STUDY OF LANGUAGE AND ITS IMPACT ON SPEECH PATHOLOGY AND SPEECH EDUCATION.

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The study of language has had a greater impact on speech pathology and speech education than any other scholarly discipline in recent years. Those of you who grew up in this profession when I did will recall that about all we had on this subject was a course on phonetics and a textbook covering the entire range of speech and language disordrs that started out with a chapter on something like the "Normal Development of Speech." Typically this chapter consisted of an outline of the stages from the birth cry through babbling and ending with "the first word," or even more mysteriously, with "true speech." In contrast, today's university training programs for speech pathologists and speech teachers include coursework in psycholinguistics and language acquisition in children, complete with extensive bibliographies of recent books and journals. At the same time, speech pathologists and speech teachers who completed their formal training before the study of language was part of the curriculum have discovered the need to acquire comprehensive information on this subject. A number of recent developments in our own profession and related disciplines have combined to make speech pathologists and speech teachers keenly aware of their deficiencies if they lack such information.

Firstly, our responsibilities in recent years have come to include growing numbers of children with language difficulties. In most places the speech pathologist can no longer justify his

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existence by limiting his caseload to children with defective articulation. Both speech pathologist and classroom teacher deal with the language and learning problems of brain-injured, retarded, autistic, learning-disabled, and language-delayed children. In addition, the schools have become more concerned with the special needs of bilingual and inner-city children, and school personnel have had to face the issue of distinguishing language disorders from language differences.

Another development that has focussed attention on the study of language has been the emergence of several important test instruments. In order to use some of these tests, both school and clinic personnel find that they must become thoroughly familiar with the theoretical foundations for measuring language skills. To handle the Illinois Test of Psycholinguistic Abilities intelligently, it is necessary to understand Osgood's model of language upon which the ITPA was based. To use the Northwestern Syntax Screening Test, it is helpful to know something of the available research into the relationships among the processes of imitation, comprehension, and production of sentences by children. To use the Developmental Sentence Scoring Test it is useful to be familiar with the stages through which normal children go in the acquisition of particular syntactic structures. To evaluate the Fisher-Logeman test of articulation against other articulation inventories in the closet, one must be acquainted with distinctive feature theory and its applications and limitations in the analysis of defective articulation.

Developments within the study of language itself have involved the interest of all professionals who deal with communication. For example, the field of developmental psycholinguistics has in the past 12 years or so exploded into an impressive body of research data with critical implications for the goals and the procedures of language training and language modification. Speech pathologists today cannot even read their own literature without a firm foundation in the study of language. A look at some recent titles in the Journal of Speech and Hearing Disorders and the Journal of Speech and Hearing Research will illustrate this point:

"What is Deviant Language?"
"Distinctive Feature Generalization in Articulation Training."
"Why Not Pivot Grammar?"
"Generative Studies of Children's Phonological Disorders."
"A Problem of Language Disorder: Length Versus Structure."
"Auditory Comprehension of English by Monolingual and Bilingual Preschool Children."

Furthermore, speech pathologists cannot make use of new language training techniques without an understanding of the implications of primary research in language learning and language behavior. In a recent article, McReynolds ( ) shows that operant conditioning techniques can be successfully applied to establishing desired behaviors for language-disordered children. In order to utilize the techniques that she describes, however, she points out

that a first step is to determine which behaviors are to be established. In other words, if a clinical technique is to be used successfully, the clinician must first af all have some firm basis on which to decide what it is he is going to teach next. The normal developmental progression in language acquisition is one likely candidate for such decisions; there are others, but the point is that the clinician must know them if he is going to make non-arbitrary selections of the short-term and long-term goals of language training to which to apply his clinical skills and techniques.

The information about language that can be translated into practical application by speech pathologists and speech teachers comes from various disciplines: the list must certainly begin with linguistics, psychology, and psycholinguistics, but also includes mathematics, sociology, anthropology, and philosophy. Let us proceed to examine some of the outstanding contrications of these areas to our understanding of the study of language, and consider as well some recent trends. Since time is far too limitad today to do anything like a comprehensive review, I will select only some illustrative examples (which of course are also illustrative of my own biases about what is important).

In linguistics, certainly the highlight has been the approach initiated by Chomsky - that of looking at language in the abstract from the generative standpoint. Replacing the older tradition of analyzing sentences into parts of speech and the grammatical relations among them, the generative concept instead

seeks to discover the rules that may be used to generate the infinite number of grammatical sentences in the language under consideration. Chomsky is responsible for the insight that the spoken (or written) form of the sentence is by no means adequate to an understanding of its structure and derivation; he postulated that for every sentence there is a surface structure, corresponding roughly to how the sentence may be spoken, and a deep structure, corresponding roughly to how the sentence may be meaningfully interpreted; a set of rules called transformations relate deep to surface structures. This view of grammar, in spite of its abstract nature, has immediate implications for some very practical concerns about how language skills may develop in real life: For example, it suggests that imitation could not have a very important role in language learning, because the only examples available to the child or the second language learner are surface structures, and what the language learner really needs to learn are not a lengthy set of sentences from which to select the one he happens to need, but rather a smaller set of rules to generate infinitely many sentences, and also how to generate and retrieve the deep structures that underlie spoken sentences and how to perform the transformations that relate them. Having reached this conclusion, the next step is to note that when it is our job to teach language to children who cannot figure these things out for themselves as normal children do, what we must somehow teach are not words, not sentences, but rules. (It is no secret that we are still trying to learn how to do this. In any case, we count it as a success, that is, we conclude that a child has indeed learned a rule, when he produces grammatical sentences that are novel, not merely repe-

titions of some he has been previously exposed to.)

Although certainly some of the most significant developments in modern linguistics concerned syntactic structure, more recently much attention has been given to phonological analysis, on the one hand, and to the analysis of meaning, on the other. There is much debate about where in the linguistic model (if at all) there may be a place for the speaker's intentions. Are meanings generated before the structures that will represent them? This problem is not unrelated to questions about the relationship of language to thinking, and certainly must affect our understanding of what we are doing when we teach language.

A second discipline that has been heavily involved in the language business is psychology. Unlike linguists, psychologists of language are concerned not with language in the abstract but rather with an account of how the speaker-listener functions. Earlier I mentioned the work of Osgood, who developed a model of language with this emphasis on the language-user.rather than on the structure of language itself. In Osgood's model, the processes of language use include decoding, encoding, and association; furthermore, all of these processes can be considered at three levels, the projection, or sensory-motor level, the integrational, or perceptual-skill level, and finally, the representational, or level of meaning and intention. This model also includes Osgoods theory of meaning as a representational mediational device, which is a version of stimulus-response learningtheory that postulates an

internalized, non-observable element as the "meaning" that mediates between the heard verbal stimulus and the response to that stimulus. Osgood's language model, as I pointed out before, formed the basis for the construction of the ITPA, so we need look no further for the practical application of this work.

The psychologist whose name has been most closely identified with the study of language behavior is, of course, Skinner. His famous book Verbal Behavior gives a comprehensive account of the theory of language behavior within the framework of instrumental learning, or operant conditinning. Although this theory fails, in my opinion (and also that of Chomsky, among others, so I am in rather famous company on this issue) to account for anything muchin the way of what we most want to know about language and its development, there is certainly no doubt that it has provided considerable impetus to the development of clinical techniques to establish and modify verbal behavior. The application of operant conditioning procedures in the clinical situation has been markedly successful in modifying the behavior of children and adults who seemed unapproachable byother methods, but when the questbn of what verbal behaviors to establish arises, Skinner's account gives no clue and the clinician must look to other sources for usable guidelines

The field of psycholinguistics is frequently described as the place where psychology and linguistics meed in matters of mutual interest. Certainly I have thus far spoken as if linguistics and psychology were totally independent studies, but of course I have chosen my examples to illustrate that particular aspect of the disciplines. Now we can begin to look at some of the examples

of theory and research that involve both linguistics and psychology so that it becomes difficult, or even irrelevant, to know where one leaves off and the other begins.

The most crucial problem for the psycholinguists is to explain how human users of language manage to understand and produce sentences thay have not heard or spoken before. They have explored a number of possibilities, hoping to show, at one point, that the steps in producing a spoken sentence ought to correspond to the number of transformational rules needed to get the sentence from the deep structure to the surface structure. This attempt was not successful, but psycholinguistic reaearch continues to seek an intelligible account of what makes some sentences more complex than others. Other psycholinguists have attempted to describe the strategies that the language user applies then he processes sentences, to show, for example, how these strategies may relate to knowledge about sentence constituents and phrase structure, or to grammatical or semantic relations among sentence elements. Others have worked on isolating the basic unit of which sentences are composed (or decomposed), and have shown that this unit may be the phoneme, the syllable, the work, the phrase, the phonemic clause, the sentence iteelf, or all of the above -- or none of the above. There are more questions than answers to this problem of how sentences are understood and produced, but certainly it is the right question.

One of the major areas of contribution of psycholinguistic research to the kinds of things that interest us has been the acquisition of language in children. The great break-through was

the work that showed, some ten years ago, that even the earliest utterances of children beyond the single-word stage could be described as rule-governed behavior. Researchers in child language demonstrated that it was perfectly possible to write "grammars" for the linguistic output of the normal child at every age and stage. It became fashionable to look for the "system" of rules that underlies children's phonology as well as their syntax and morphology. Of immediate practical application to the clinician was the plotting of the various stages through which normal children go on the path to developing the adult version of such sentence types as the negative and Wh-questions, for clinicians found in this information a ready answer to the question of what to teach next. The current emphasis is on research into the acquisition of meaning in language, and although the studies have only just begun to scratch the surface of this difficult subject, some data are already available to help the clinician know what to expect - for example, we now know that it is not unusual for young children to confuse the words "more" and "less", and to have an earlier grasp of the meaning of "before" than the meaning of "after."

As might be expected, some of these approaches in psycholinguistic research have been applied to subjects with disordered communication. Aphasia in adults, stuttering, childhood language disorders, and defective articulation have all been studied with psycholinguistic research tools. A fairly early example is the work of Menyuk, who demonstrated that among the "sentences" produced by children with deviant language were some types that did not appear at any stage in the output of normals, and concluded that deviant language could therefore not merely be described

as delayed or infantile. A topic of considerable interest in current research is the question of the underlying nature of childhood language disorders; is the problem best described as one of syntax, of sequencing, or of cognition? (Tune in next week.)

Some very brief remarks, to conclude, about other disciplines hat thave contributed to our knowledge about language: Studies of word frequency and its effect on language learning and behavior stem from mathematics, as does information theory and the application of probability theory to the construction and comprehension of sentences in normal and deviant language. The current boom of interest in dialectology and in nonverbal language has its roots in sociology and anthropology. Finally, some current approaches to the analysis of the functions of language in children and adults derive from the modern trends in philosophy.

I hope that having sat through this lightning review, you are upset enough to run right out and buy a few books and sign up for a few lectures. There is indeed much to learn, and many rewards in the learning.